

Application No. 10/609,102
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AMENDMENTS TO THE CLAIMS

The following is a complete listing of the claims, which replaces all previous versions and listings of the claims.

1. (withdrawn) A method for co-producing hydrogen and electrical power comprising:

utilizing an intermittent renewable energy source to generate energy for producing hydrogen and oxygen;

transferring at least a portion of said energy to a production system to produce said hydrogen and said oxygen;

channeling at least a portion of said hydrogen to a hydrogen-delivery system configured to deliver the hydrogen from said hydrogen-delivery system to at least one of a power generation system or a hydrogen-storage system;

channeling at least a portion of said oxygen to an oxygen delivery system configured to deliver the oxygen from said oxygen delivery system to a biomass gasification system to produce a synthesis gas by partial oxidation of a biomass feedstock; and

channeling at least a portion of said synthesis gas to said power generation system to produce electrical power therefrom.

2. (withdrawn) The method of claim 1, further comprises the steps of:

channeling at least a portion of said synthesis gas from said biomass gasification system to said hydrogen-reforming system to reform hydrogen; and

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channeling said hydrogen from said hydrogen-reforming system to said hydrogen-delivery system further configured to deliver the hydrogen to at least one of said power generation system or said hydrogen-storage system.

3. (withdrawn) The method of claim 1, wherein said power generation system comprises a hydrogen-based electricity production system.
4. (withdrawn) The method of claim 3, wherein said hydrogen-based electricity production system comprises at least one of a fuel cell-based electricity production system or a micro-turbine-based electricity production system or an internal combustion engine-based electricity production system or combinations thereof.
5. (withdrawn) The method of claim 1, wherein said intermittent renewable energy comprises at least one of wind energy or solar energy or tidal energy.
6. (withdrawn) The method of claim 1, wherein said energy comprises at least one of thermal energy or electrical energy.
7. (withdrawn) The method of claim 1, wherein said production system is selected from the group consisting of an electrolysis system, a thermal splitting system, an electro-thermal splitting system, a thermo-chemical splitting system, a photo-chemical splitting system, a photo-electrochemical splitting system and combinations thereof.

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8. (withdrawn) The method of claim 1, wherein said biomass gasification system comprises at least one of a fixed bed biomass gasification system or a fluidized bed biomass gasification system.

9. (withdrawn) The method of claim 1, wherein said biomass feedstock is selected from the group consisting of industrial wastes, agricultural wastes, municipal wastes, organic wastes, energy crops and combinations thereof.

10. (withdrawn) A method for co-producing hydrogen and electrical power comprising:

utilizing an intermittent renewable energy source to generate energy for producing hydrogen and oxygen ;

transferring at least a portion of said energy to a production system to produce said hydrogen and said oxygen;

channeling at least a portion of said hydrogen to a hydrogen-delivery system configured to deliver the hydrogen from said hydrogen-delivery system to a hydrogen-based electricity production system to produce electrical power therefrom; and

channeling at least a portion of said oxygen to an oxygen delivery system configured to deliver the oxygen from said oxygen delivery system to a biomass gasification system to produce a synthesis gas by partial oxidation of a biomass feedstock.

11. (withdrawn) The method of claim 10, further comprises the step of:

channeling said synthesis gas from said biomass gasification system to said hydrogen-reforming system to reform hydrogen; and

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channeling said hydrogen from said hydrogen-reforming system to said hydrogen-delivery system configured to deliver the hydrogen from the hydrogen-delivery system to said hydrogen-based electricity production system to produce electrical power therefrom.

12. (withdrawn) The method of claim 10, wherein said hydrogen-based electricity production system comprises at least one of fuel cell-based electricity production system or a micro-turbine-based electricity production system or an internal combustion engine-based electricity production system or a combination thereof.

13. (withdrawn) The method of claim 10, wherein said intermittent renewable energy comprises at least one of wind energy or solar energy or tidal energy.

14. (withdrawn) The method of claim 10, wherein said energy comprises at least one of thermal energy or electrical energy.

15. (withdrawn) The method of claim 10, wherein said production system is selected from the group consisting of an electrolysis system, a thermal splitting system, an electro-thermal splitting system, a thermo-chemical splitting system, a photo-chemical splitting system, a photo-electrochemical splitting system and combinations thereof.

16. (withdrawn) A method for co-producing hydrogen and electrical power comprising:

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utilizing an intermittent renewable energy source to generate energy for producing hydrogen and oxygen;

transferring at least a portion of said energy to a production system to produce said hydrogen and said oxygen;

channeling said hydrogen to a hydrogen-delivery system configured to deliver the hydrogen from said hydrogen-delivery system to a power generation system to produce electrical power therefrom;

channeling said oxygen to an oxygen delivery system configured to deliver the oxygen from said oxygen delivery system to a biomass gasification system to produce a synthesis gas by partial oxidation of a biomass feedstock; and

channeling said synthesis gas to said power generation system to produce electrical power therefrom.

17. (withdrawn) The method of claim 16, wherein said power generation system comprises a hydrogen-based electricity production system.

18. (withdrawn) The method of claim 17, wherein said hydrogen-based electricity production system comprises at least one of fuel cell-based electricity production system or a micro-turbine-based electricity production system or an internal combustion engine-based electricity production system or a combination thereof.

19. (withdrawn) The method of claim 16, wherein said intermittent renewable energy comprises at least one of wind energy or solar energy or tidal energy.

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20. (withdrawn) The method of claim 16, wherein said energy comprises at least one of thermal energy or electrical energy.

21. (withdrawn) The method of claim 16, wherein said production system is selected from the group consisting of an electrolysis system, a thermal splitting system, an electro-thermal splitting system, a thermo-chemical splitting system, a photo-chemical splitting system, a photo-electrochemical splitting system and combinations thereof.

22. (previously presented) A system for co-producing hydrogen and electrical power comprising:

an energy generating system for generating energy from an intermittent renewable energy source;

a production system in energy communication with said energy generating system for producing hydrogen and oxygen;

a hydrogen-delivery system in fluid communication with said production system for receiving at least a portion of said hydrogen from said production system; said hydrogen-delivery system further configured to channel at least a portion of said hydrogen to at least one of a power generation system or a hydrogen storage system; and

an oxygen delivery system in fluid communication with said production system for receiving at least a portion of said oxygen from said production system; said oxygen delivery system further configured to channel at least a portion of said oxygen to a biomass gasification system to produce a synthesis gas by partial oxidation of a biomass feedstock;

wherein said biomass gasification system is further configured to channel at least a portion of a synthesis gas to said power generation system.

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23. (original) The system of claim 22 further comprising a hydrogen-reforming system for reforming said hydrogen from at least a portion of said synthesis gas;

wherein said hydrogen-reforming system is further configured to channel said hydrogen from said hydrogen-reforming system to said hydrogen-delivery system.

24. (original) The system of claim 22, wherein said power generation system comprises a hydrogen-based electricity production system.

25. (original) The system of claim 24, wherein said hydrogen-based electricity production system comprises at least one of fuel cell-based electricity production system or a micro-turbine-based electricity production system or an internal combustion engine-based electricity production system or a combination thereof.

26. (original) The system of claim 22, wherein said intermittent renewable energy comprises at least one of wind energy or solar energy or tidal energy.

27. (original) The system of claim 22, wherein said energy comprises at least one of thermal energy or electrical energy.

28. (original) The system of claim 22, wherein said production system is selected from the group consisting of an electrolysis system, a thermal splitting system, an electro-

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thermal splitting system, a thermo-chemical splitting system, a photo-chemical splitting system, a photo-electrochemical splitting system and combinations thereof.

29. (original) The system of claim 22, wherein said biomass gasification system comprises at least one of a fixed bed biomass gasification system or a fluidized bed biomass gasification system.

30. (original) The system of claim 22, wherein said biomass feedstock is selected from the group consisting of industrial wastes, agricultural wastes, municipal waste, organic wastes, energy crops and combinations thereof.

31. (previously presented) A system for co-producing hydrogen and electrical power comprising:

an energy generating system for generating energy from an intermittent renewable energy source;

a production system in energy communication with said energy generating system for producing hydrogen and oxygen;

a hydrogen-delivery system in fluid communication with said production system for receiving at least a portion of said hydrogen from said production system; said hydrogen-delivery system further configured to channel at least a portion of said hydrogen to a hydrogen based power generation system to produce electrical power therefrom; and

an oxygen delivery system in fluid communication with said production system for receiving at least a portion of said oxygen from said production system; said oxygen delivery system further configured to channel at least a portion of said oxygen to a

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biomass gasification system to produce a synthesis gas by partial oxidation of a biomass feedstock.

32. (previously presented) The system of claim 31 further comprising a hydrogen-reforming system for reforming said hydrogen from at least a portion of said synthesis gas;

wherein said hydrogen-reforming system is further configured to channel said hydrogen from said hydrogen-reforming system to said hydrogen-delivery system.

33. (previously presented) The system of claim 31 wherein said hydrogen-based electricity production system comprises at least one of fuel cell-based electricity production system or a micro-turbine-based electricity production system or an internal combustion engine-based electricity production system or a combination thereof..

34. (previously presented) The system of claim 31, wherein said intermittent renewable energy comprises at least one of wind energy or solar energy or tidal energy.

35. (previously presented) The system of claim 31, wherein said energy comprises at least one of thermal energy or electrical energy.

36. (previously presented) The system of claim 31, wherein said production system is selected from the group consisting of an electrolysis system, a thermal splitting system, an electro-thermal splitting system, a thermo-chemical splitting system, a photo-

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chemical splitting system, a photo-electrochemical splitting system and combinations thereof.

37. (previously presented) A system for co-producing hydrogen and electrical power comprising:

an energy generating system for generating energy from an intermittent renewable energy source;

a production system in energy communication with said energy generating system for producing hydrogen and oxygen;

a hydrogen-delivery system in fluid communication with said production system for receiving at least a portion of said hydrogen from said production system; said hydrogen-delivery system further configured to channel at least a portion of said hydrogen to a power generation system to produce electrical power therefrom; and

an oxygen delivery system in fluid communication with said production system for receiving at least a portion of said oxygen from said production system; said oxygen delivery system further configured to channel at least a portion of said oxygen to a biomass gasification system to produce a synthesis gas by partial oxidation of a biomass feedstock;

wherein said biomass gasification system is further configured to channel at least a portion of a synthesis gas to said power generation system.

38. (previously presented) The system of claim 37, wherein said power generation system comprises a hydrogen-based electricity production system.

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39. (previously presented) The system of claim 37, wherein said hydrogen-based electricity production system comprises at least one of fuel cell-based electricity production system or a micro-turbine-based electricity production system or an internal combustion engine-based electricity production system or a combination thereof.

40. (previously presented) The system of claim 37, wherein said intermittent renewable energy comprises at least one of wind energy or solar energy or tidal energy.

41. (previously presented) The system of claim 37, wherein said energy comprises at least one of thermal energy or electrical energy.

42. (previously presented) The system of claim 37, wherein said production system is selected from the group consisting of an electrolysis system, a thermal splitting system, an electro-thermal splitting system, a thermo-chemical splitting system, a photo-chemical splitting system, a photo-electrochemical splitting system and combinations thereof.